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ABSTRACT

The number of educational software packages on today's market is growing steadily. A large percentage of them are found to be of poor quality in terms of instructional and/or technical design. Arguing that a microcomputer in the classroom is only as effective as the software used with it, the first part of this digest provides an overview of the basic steps in courseware selection and evaluation that are recommended in the educational literature: (1) evaluating needs and constraints; (2) identifying software titles and previewing copies; and (3) evaluating the software package. Criteria for evaluating the content, instructional qualities, and technical characteristics of courseware are included in the second part. Finally, a select resource guide lists organizations, journals, guidebooks, indexes, and databases from which useful information can be obtained. (7 references) (GL)

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ERIC DIGEST

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Selecting Microcomputer Courseware

by Elena D. Beattie and Nancy R. Preston

Thousands of packages of educational software, or courseware, exist on today's market, and the number is growing steadily. Unfortunately, a large percentage of the packages produced are found to be of poor quality in terms of instructional and/or technical design. Since a microcomputer in the classroom is only as effective as the software used with it, it is wise to investigate courseware thoroughly before purchasing it.

The purpose of this digest is to provide an overview of the basic steps in courseware selection and evaluation that are being recommended in the educational literature. In addition, a select list of useful publications and important organizations for the computer-using educator will be presented.

Step One: Evaluate Needs and Constraints

Before suitable courseware can be identified, the *instructional need* for it must be defined. (This presupposes an understanding of the strengths and weaknesses of the computer as a teaching medium.) Considerations should include curriculum objectives, students' level and ability, desired effect, and, of course, subject content. Questions to ask are: Where among instructional objectives would an alternate delivery method be most useful? Will the software be needed to assist in memorization? To provide drill and practice exercises? To teach new information? Or would it ideally develop problem-solving and synthesizing skills?

Hardware capabilities must also be evaluated before software selection can begin. For either existing hardware or equipment that will be purchased, the following questions should be answered: What brand and model computer will be employed? What is its memory capacity? Does it support graphics, color, and sound? Are peripherals, such as a printer, extra disc drive, mouse, or game paddles, available? Will the equipment be used for several purposes and/or shared by more than one teacher, or will it be dedicated to the use under consideration?

Finally, *management concerns* must be addressed. How does the acquisition of courseware fit into the plan of the school or program? Does the school expect to upgrade its hardware in quantity or quality? Will a network or lab be established, and will a site license be required? How much money can be spent on software for the next several years?

Step Two: Identify Software Titles and Obtain Preview Copies

Once the need for educational software has been clarified, a list of potential software packages should be compiled. There are a variety of resources that will help educators sift through the great number of available titles. These include education journals, producer catalogs, indexes, databases, and guidebooks which make titles accessible by subject matter, grade level, hardware requirements, reviewers' scores, and other criteria. In addition, software can often be seen in use at conference exhibits and at educators' resource centers. Word-of-mouth information supplied by colleagues having experience with specific courseware titles can also be valuable.

Regardless of one's source of information, there are two important points to remember regarding software evaluation: (1) to date, very little empirical research exists that identifies specific factors making educational software effective or not effective (Jolicoeur & Berger, 1988), and (2) what is judged to be effective in one situation may not be as useful when used in a different place, with different students, or in a different manner (Cafarella, 1987). Therefore, a computer-using educator must not rely solely on existing reviews, but develop a set of criteria by which to evaluate software according to his or her own setting and goals.

The best evaluative information comes from a firsthand examination of the software under consideration. Many software dealers have established 30-day preview policies. While others are reluctant to loan software, some educators are able to obtain preview copies by writing on school letterhead, explaining that the school policy requires software to be previewed before purchase, and guaranteeing that no duplicate will be made (Doll, 1988, p. 50). When software cannot be obtained either way, it may be possible to borrow it from a library or to examine it at a nearby school where it is in use.

Alternate sources for preview copies include software preview centers, sometimes located at universities or affiliated with state departments of education. One such center is the Technology Center for Demonstration and Training of the Northwest Regional Educational Laboratory (NWREL). Educators trying to locate preview centers should call their state department of education.

Step Three: Evaluate

Once preview copies of software have been obtained, educators should thoroughly test them to assess the quality of their content and instructional and technical design. If possible, software that has passed its preliminary screening should be evaluated by the students for whom it is intended. Student previews often generate important information that affects purchasing decisions.

Many organizations have published their own evaluation criteria; the following list is based on the standard evaluation form for the NWREL MicroSIFT Project.

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Characteristics of Good Courseware

Content Characteristics

- content is accurate
- content has educational value
- content is free of racial, ethnic, and sex stereotypes

Instructional Characteristics

- purpose of package is well-defined
- package achieves its defined purpose
- presentation of content is clear and logical
- level of difficulty is appropriate for target audience
- graphics/color/sound are used for appropriate instructional reasons
- use of the package is motivational
- package effectively stimulates student creativity
- feedback on student responses is effectively employed
- learner controls the rate and sequence of presentation and review
- instruction is integrated with previous student experience
- learning is generalizable to an appropriate range of situations

Technical Characteristics

- user support materials are comprehensive and effective
- information displays are effective
- students can easily and independently operate the program
- teachers can easily employ the package
- program provides accounting features that allow teachers to track student progress
- program appropriately uses relevant computer capabilities
- program is reliable in normal use

Resource List

Organizations

Northwest Regional Education Laboratory (NWREL). 101 S.W. Main St., Suite 500, Portland, OR 97204. Sponsors the MicroSIFT Project, a clearinghouse for information about educational software products. (Many publications of the MicroSIFT Project are announced in ERIC's *Resources in Education.)* Products include:

- *RICE (Resources in Computer Education) Database*, comprehensive, descriptive information about courseware;
- *MicroSIFT Reports*, product comparisons issued three times a year;
- *New and Promising*, semi-annual list of software titles designated by preview centers.

Southeastern Educational Improvement Laboratory. P.O. Box 12746, Research Triangle Park, NC 27709-2746. A collaborative effort involving six state departments of education. Produces *SEED Software Annotations*, evaluative reports issued twice a year in sets of 50 or more.

Education Products Information Exchange (EPIE) Institute. P.O. Box 839, Water Mill, NY 11976. Systematically collects and analyzes user data on instructional materials. Publishes *T.E.S.S.: The Educational Software Selector* (3rd edition 1986; supplement 1988). This comprehensive guide to courseware synthesizes information from about 50 objective review sources and provides vendor information, including preview policies.

Journals

Dozens of education journals publish software reviews in each issue. The following titles are representative:

Computing Teacher. International Council for Computers in Education, 1787 Agate St., University of Oregon, Eugene, OR 97403. Monthly.

Classroom Computer Learning. Peter Li, Inc., 2451 East River Rd., Dayton, OH 45439. Monthly.

Electronic Learning. Scholastic, Inc., 730 Broadway, New York, NY 10003. 8 issues/year.

Educational Technology. Educational Technology Publications, 720 Palisade Ave., Englewood Cliffs, NJ 07632. Monthly.

Guidebook

Only the Best. By Shirley Boes Neill and George W. Neill. New York: R.R. Bowker. 1985-. A guide to the courseware produced every year that has received the highest ratings of a select list of evaluation services.

Indexes and Databases

The following resources provide reviews, condensed reviews, or references to reviews from a variety of publications:

Digest of Software Reviews: Education. School & Home Courseware, Inc., 3999 N. Chestnut Diag., Suite 333, Fresno, CA 93726-4797. Monthly.

Microcomputer Index. Database Services, Inc., 2685 Marine Way, Suite 1305, Mountain View, CA 94043-1125. Bi-monthly. (Available in print and online through Dialog.)

Software Reviews on File. Facts on File, Inc., 460 Park Ave. S., New York, NY 10016. Monthly.

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Chang, Linda Li. (1986, April). *How to evaluate educational software easily and efficiently.* (ED 298 175).

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